



EXCERPT FROM THE
PROCEEDINGS
OF THE
SIXTH ANNUAL ACQUISITION
RESEARCH SYMPOSIUM

**MANAGING THE SERVICES SUPPLY CHAIN
IN THE DEPARTMENT OF DEFENSE:
AN EMPIRICAL STUDY OF CURRENT MANAGEMENT PRACTICES**

Published: 22 April 2009

by

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**6th Annual Acquisition Research Symposium
of the Naval Postgraduate School:**

**Volume II:
Defense Acquisition in Transition**

May 13-14, 2009

Approved for public release, distribution is unlimited.

Prepared for: Naval Postgraduate School, Monterey, California 93943



ACQUISITION RESEARCH PROGRAM
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Report Documentation Page			Form Approved OMB No. 0704-0188		
<p>Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p>					
1. REPORT DATE APR 2009	2. REPORT TYPE	3. DATES COVERED 00-00-2009 to 00-00-2009			
<p>4. TITLE AND SUBTITLE Managing the Services Supply Chain in the Department of Defense: An Empirical Study of Current Management Practices</p>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
<p>6. AUTHOR(S)</p>				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
<p>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School, Graduate School of Business and Public Policy, Monterey, CA, 93943</p>				8. PERFORMING ORGANIZATION REPORT NUMBER	
<p>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</p>				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
<p>12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited</p>					
13. SUPPLEMENTARY NOTES					
<p>14. ABSTRACT</p> <p>This paper presents the results of our ongoing research on the management of services acquisition in the Department of Defense. In this empirical study, we developed and used a web-based survey to collect data on the acquisition strategy, procurement methods, and contract types used at Air Force and Navy installations. Specifically, we studied the current management practices in such areas as lifecycle approach, project management organization/management structure, and training provided to services acquisition personnel. We found that the majority of the services contracts awarded and administered conformed to our expectation. For example, most service contracts are competitively bid, fixedpriced awards without any type of contract incentive. However, we found that the Air Force and Navy use different contracting approaches in the following areas: organizational level of acquisition offices (regional versus installation), the use of project teams, leaders of the acquisition effort (program personnel versus contracting officers), and managers of the services requirement (program personnel, contracting officers, and customer organizations). We analyzed the implications and impact of different approaches on the effectiveness of the contract management process and make recommendations for improving the management of services acquisition in the Department of Defense.</p>					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 77	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The research presented at the symposium was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

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The following article is taken as an excerpt from the proceedings of the annual Acquisition Research Program. This annual event showcases the research projects funded through the Acquisition Research Program at the Graduate School of Business and Public Policy at the Naval Postgraduate School. Featuring keynote speakers, plenary panels, multiple panel sessions, a student research poster show and social events, the Annual Acquisition Research Symposium offers a candid environment where high-ranking Department of Defense (DoD) officials, industry officials, accomplished faculty and military students are encouraged to collaborate on finding applicable solutions to the challenges facing acquisition policies and processes within the DoD today. By jointly and publicly questioning the norms of industry and academia, the resulting research benefits from myriad perspectives and collaborations which can identify better solutions and practices in acquisition, contract, financial, logistics and program management.

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Managing the Services Supply Chain in the Department of Defense: An Empirical Study of Current Management Practices

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Apte has successfully completed various research projects involving applications of mathematical models and optimization techniques. Her research interests are in the areas of developing mathematical models and algorithms for complex, real-world operational problems—especially in the area of humanitarian logistics and critical infrastructure networks using techniques of combinatorial optimization, network programming, and mixed-integer programming based on heuristic search methods. It is also important to her that her research is directly applicable to practical problems and has significant value-adding potential. Her research articles have been published in prestigious journals, including *Naval Research Logistics*, *Production and Operations Management*, and *Interfaces*. She has published several articles in the Acquisition Research Sponsored Report Series, GSBPP, NPS. She also has a patent pending for "SONET Ring Designer Tool," created when she worked as a consultant for MCI.

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Rendon has taught contract management courses for the UCLA Government Contracts program; he was also a senior faculty member for the Keller Graduate School of Management, where he taught MBA courses in project management and contract management. He is a graduate of the US Air Force Squadron Officer School, Air Command and Staff College, Air War College, and the Department of Defense Systems Management College. Rendon is Level III certified in both Program Management and Contracting under the *Defense Acquisition Workforce Improvement Act (DAWIA)* program. He is also a Certified Professional Contracts Manager (CPCM) with the National Contract Management Association (NCMA), a Certified Purchasing Manager (C.P.M.) with the Institute for Supply Management (ISM), and a certified Project Management Professional (PMP) with the Project Management Institute (PMI). He has received the prestigious Fellow Award from NCMA, and he was recognized with the United States Air Force Outstanding Officer in Contracting Award. He has also received the NCMA National Education Award and the NCMA Outstanding Fellow Award. Rendon is a member of the ISM Certification Committee and serves on the Editorial Review Board for the ISM *Inside Supply Management* magazine. He is a member of the NCMA Board of Advisors, as well as associate editor for its *Journal of Contract Management*. Rendon's publications include *Government Contracting Basics* (2007), *U.S. Military Program Management: Lessons Learned & Best Practices* (2007), and *Contract Management Organizational Assessment Tools* (2005). He has also published scholarly articles in the *Contract Management* magazine, the *Journal of Contract Management*, the *Program Manager* magazine, the *Project Management Journal*, and the *PM Network* magazine. He is a frequent speaker at universities and professional conferences and provides consulting to both government and industry.

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Abstract

This paper presents the results of our ongoing research on the management of services acquisition in the Department of Defense. In this empirical study, we developed and used a web-based survey to collect data on the acquisition strategy, procurement methods, and contract types used at Air Force and Navy installations. Specifically, we studied the current



management practices in such areas as lifecycle approach, project management, organization/management structure, and training provided to services acquisition personnel.

We found that the majority of the services contracts awarded and administered conformed to our expectation. For example, most service contracts are competitively bid, fixed-priced awards without any type of contract incentive. However, we found that the Air Force and Navy use different contracting approaches in the following areas: organizational level of acquisition offices (regional versus installation), the use of project teams, leaders of the acquisition effort (program personnel versus contracting officers), and managers of the services requirement (program personnel, contracting officers, and customer organizations). We analyzed the implications and impact of different approaches on the effectiveness of the contract management process and make recommendations for improving the management of services acquisition in the Department of Defense.

Keywords: Service Supply Chain, Services Acquisition, Service Lifecycle, Contract Management, Project Management, Program Management

1.0 Introduction

Services acquisition in the US Department of Defense (DoD) has continued to increase in scope and dollars in the past decade. In fact, even considering the high value of weapon systems and large military items purchased in recent years, the DoD has spent more on services than on supplies, equipment and goods (Camm, Blickstein & Venzor, 2004). For example, the Department of Defense obligations on contracts have more than doubled between fiscal years 2001 and 2008—to over \$387 billion, with over \$200 billion spent just for services (GAO, 2009). The acquired services presently cover a very broad set of service activities—including professional, administrative, and management support; construction, repair, and maintenance of facilities and equipment; information technology; research and development; and medical care.

As the DoD's services acquisition continues to increase in scope and dollars, the DoD must give greater attention to proper acquisition planning, adequate requirements definition, sufficient price evaluation, and proper contractor oversight (GAO, 2002). Recently, the Director of Defense Procurement and Acquisition Policy (DPAP) identified the inappropriate use of services contracts in the DoD (Director, DPAP, 2007, March 2) and is planning to take actions to improve contracting for services throughout the Department (Director, DPAP, 2006, August 16). In many ways, the issues affecting services acquisition are similar to those affecting the acquisition of physical supplies and weapon systems. However, the unique characteristics of services, combined with the increasing importance of services acquisition, offer a unique and significant opportunity for research into the management of the service supply chain in the Department of Defense.

We have addressed the need for research in the area of services acquisition by undertaking a series of research projects. Thus far, we have completed three research projects, and the work on the fourth research project is currently in progress.

The first research project was exploratory in nature, wherein we tried to understand the major challenges and opportunities in the service supply chain in the DoD (Apte, Ferrer, Lewis & Rendon, 2006). As a part of this research study, we conducted in-depth case studies on acquisition of services in three different organizations: Presidio of Monterey, Travis AFB and the Naval Support Detachment Monterey (NSDM).



The lack of a well-developed program management infrastructure for the acquisition of services was a critical research finding that warranted further study. Therefore, our second research project was geared towards studying the program management infrastructure in the service supply chain in the DoD. In this research, too, we conducted two additional in-depth case studies of innovative project management approaches—both at the Air Education and Training Command (AETC) and at Air Combat Command (ACC). Based on these case studies, we developed a conceptual model of a service lifecycle that can be used to analyze and design the DoD's services acquisition process. In our project report (Apte & Rendon, 2007), we discussed the program management approach, identified basic project management concepts, described how these concepts are being used in the acquisition of defense weapon systems, and recommended how they can be adapted in the acquisition of services in the DoD.

This paper presents the results of our third research project consisting of an empirical study of the management of services acquisition in the Department of Defense. In this empirical study, we developed and used a web-based survey to collect data on the acquisition strategy, procurement methods, and contract types used at Air Force and Navy installations. Specifically, we studied the current management practices in such areas as lifecycle approach, project management, organization/management structure, and training provided to services acquisition personnel.

As mentioned earlier, the work on a fourth research project is currently in progress. In this research, we are continuing with the empirical study of current management practices in the Army.

2.0 Research Objectives

The objective of the third research project is to develop a more comprehensive understanding of how services acquisition is managed at a wide range of military bases throughout the Department of Defense. This research is focused on answering the following research questions:

1. What type of acquisition strategy, procurement method, and contracts are used in services acquisition?
2. How is the service acquisition process managed? What management concepts—such as a lifecycle, a program management or a project management approach—are used?
3. What training is given to contract and project/program management staff?
4. Are there any significant differences between the way services are acquired and managed in different DoD departments?

2.1 Development and Review of Survey Instrument

The methodology for this research involves the application of a survey instrument recently developed for this specific purpose. The MBA student team of Compton and Meinshausen, under the guidance of Professors Apte, Apte, and Rendon, developed the survey instrument as part of their MBA research project (Compton & Meinshausen, 2007). This was a web-based survey instrument developed using the survey software “Survey Monkey.” The developed survey was pilot tested for its validity and was used to collect additional empirical



data regarding the current state of services acquisition management in the Navy and the Air Force at the installation level.

The services acquisition research survey begins with questions focusing on specific demographic data for each military department, major command, region, and military installation. The survey then asks specific questions related to the approach, method, and procedures used in the acquisition of services for certain specific categories of services. The specific categories of services targeted in this research are listed in Table 1 below. These service categories are considered to be the most common services acquired by the various DoD departments. Between FY99 to FY03, the DoD's spending on these types of services increased by 66%; and in FY03, the DoD spent over \$118 billion (or approximately 57% of total DoD procurement dollars) on these types of services (GAO, 2005, March). Table 1 also shows the individual service categories addressed in the responses received from the Air Force and the Navy.

Table 1. Service Categories

Service Category	Classification Code	Air Force	Navy
Professional, administrative, and mgmt. support	R	X	X
Maintenance and repair of equipment	J	X	X
Data processing and telecommunications	D	X	X
Utilities and housekeeping	S		X
Transportation and travel	V	X	

The survey instrument includes core questions related to the methods and procedures used in the acquisition of services for these five categories of services. These core questions focus on the following areas (Compton & Meinshausen, 2007):

Contract Characteristics. The purpose of this category of questions is to gain insight into the dominant procurement method and contract type used in the acquisition of services at the installation level. The contract characteristics examined in this section are degree of competition (competitively bid or sole-source), contract type (fixed-price or cost-type), and type of contract incentive (incentive-fee or award-fee or award-term).

Acquisition Management Methods. The purpose of this broad category of questions is to gain insight into the types of management methods and approaches used in the acquisition of individual services at each phase of the contract management process. For each of the contract management phases, the survey asks whether the phase was conducted at a regional, installation, or some other organizational level. This core question category also focused on whether a project-team approach was typically used in the acquisition of the respective service category at the installation level.

Project-team Approach. The purpose of this category of questions is to explore the installations that utilize a project-team approach in the services acquisition management method described above. The questions explore the position of the services acquisition project-team leader, such as a Program/Project Manager or Contracting Officer. This category of questions also explores information on the owner, generator, and approving authority of the requirement



for a specific service being acquired. Another purpose of this category of questions is to explore services acquisitions in which a project management approach was not dominantly used. For this case, too, the questions explore the position of the person leading the services acquisition and information on the owner, generator, and approving authority of the requirement.

Other Program Management Issues. This last category of core questions is focused on the use of a lifecycle approach, length of assignments for services acquisition management personnel staff, use of market research techniques, level of staffing in services acquisition management, and level of training of services acquisition management personnel. These questions use a Likert-type scale to measure the level of agreement or disagreement amongst the respondents' statements.

Finally, the survey also solicits feedback and any general comments the respondents may want to share regarding the topic of services acquisition. This survey instrument also allows the researchers to collect data that will be subsequently analyzed to answer the research questions. This analysis is presented in the next section of this paper.

3.0 Survey Data and Observations

The objective of this study—understanding the acquisition of services at diverse military bases—benefits from the collection and analysis of the previously discussed survey responses. Although creating a validated survey instrument that can guide the data collection and help us answer the research questions was a challenging and time-consuming task, this survey has been instrumental in guiding the overall direction of the study.

In this section, we present a summary of the survey data we gathered and present our observations about the data. Specifically, the data concerning various contract characteristics and acquisition management methods for individual service categories will be presented using the logical structure depicted in Figures 1 and 2. We begin with a description of the Air Force survey results (see Tables 2, 3 and 4). This will be followed by a presentation of the Navy survey results (see Tables 5, 6, and 7). Our conclusions and recommendations based on our study will then be presented in subsequent sections.

3.1 Services Acquisition: Air Force Survey Results

3.1.1 Contract Characteristics

The data on contract characteristics prevalent in various service categories are shown in Table 2 below.



Table 2. Contract Characteristics: Air Force

Service category	Degree of Competition			Contract Type			Contract Incentive		
	Competitive	Sole Source	N/A	Fixed	Cost	N/A	Award Fee	Award Term	N/A
Professional, Administrative, and Management Support									
FY03	62%	6%	32%	59%	9%	32%	9%	0%	91%
FY04	59%	6%	35%	56%	9%	35%	9%	0%	91%
FY05	59%	9%	32%	62%	6%	32%	9%	0%	91%
FY06	71%	9%	21%	71%	9%	21%	12%	0%	88%
FY07	76%	9%	15%	79%	6%	15%	12%	0%	88%
Maintenance and Repair of Equipment									
FY03	65%	6%	29%	68%	3%	29%	3%	3%	94%
FY04	65%	6%	29%	68%	3%	29%	3%	3%	94%
FY05	65%	6%	29%	68%	3%	29%	3%	3%	94%
FY06	76%	6%	18%	79%	3%	18%	3%	6%	91%
FY07	85%	6%	9%	88%	3%	9%	3%	6%	91%
Data Processing and Telecommunication									
FY03	56%	3%	41%	50%	6%	44%	9%	0%	91%
FY04	56%	3%	41%	50%	6%	44%	9%	0%	91%
FY05	56%	3%	41%	50%	6%	44%	9%	0%	91%
FY06	62%	6%	32%	59%	6%	35%	9%	0%	91%
FY07	71%	3%	26%	65%	6%	29%	9%	0%	91%
Transportation and Travel									
FY03	38%	0%	62%	38%	0%	62%	3%	0%	97%
FY04	41%	0%	59%	41%	0%	59%	3%	0%	97%
FY05	38%	0%	62%	38%	0%	62%	3%	0%	97%
FY06	47%	0%	53%	47%	0%	53%	3%	0%	97%
FY07	53%	0%	47%	53%	0%	47%	3%	0%	97%

The responses from the Air Force addressed four service categories: (1) professional, administrative and management support, (2) maintenance and repair of equipment, (3) data processing and telecommunications, and (4) transportation and travel. For each service category, we collected data concerning the degree of competition, contract type and contract incentives used. To uncover salient trends, we requested respondents to provide annual data for the past five years—from FY03 to FY07. Following are some observations about the data. In the interest of brevity, we refer only to the data for FY07.

- **Professional, Administrative, & Management Support Services:** Based on Table 2, we see that a competitive approach is used 76% of the time, while sole-source is only used 9% of the time. Additionally, fixed-price-type contracts are used 79% of the time, while cost-type contracts are only used 6% of the time. Finally, contract incentives are rarely used in any capacity, only about 12% of the time.
- **Maintenance and Repair of Equipment:** In Table 2, we note that a competitive approach is used 85% of the time, while sole-source is only used 6% of the time consistently. Additionally, fixed-price-type contracts are used 88% of the time, while cost-type contracts are only used 3% of the time consistently. Contract incentives are rarely used in any capacity, only 9% of the time.
- **Data Processing and Telecommunications:** Based on Table 2, we see that a competitive approach is used 71% of the time, while sole-source is only used 3% of the time consistently. Additionally, fixed-price-type contracts are used 65% of the time, while cost-type contracts are only used 6% of the time consistently. Contract incentives are rarely but consistently used, only 9% of the time.



- **Transportation and Travel:** Again, Table 2 suggests that a competitive approach is predominantly used—53% of the time—while sole-source is not used at all. This may be due to the fact that many bases do not purchase transportation within their Contracting Squadron. Another answer to the high N/A (not applicable) number is the fact that contracting squadrons might issue delivery task orders from large indefinite-quantity, indefinite-delivery-type contracts; thus the respondents answered not applicable to this question. Additionally, fixed-price-type contracts are used 53% of the time, while cost-type contracts were not used at all. Contract incentives are only used 3% of the time consistently.

3.1.2 Acquisition Management Methods

The Air Force typically employs the acquisition of the services at the installation level. The administrative portion of the survey focused on the respondents' branch of service and MAJCOM. All 34 respondents were from the USAF. Out of the 34 respondents, 10 were on location with the Air Combat Command (ACC); 7 respondents were from the Air Mobility Command (AMC); 6 respondents were from the Air Education and Training Command (AETC); 6 respondents were from the Air Force Space Command (AFSPC); 4 respondents were from the Air Force Material Command (AFMC), and, finally, one respondent was from the Air Force Special Operations Command (AFSOC). Our team wanted this survey data to be unbiased, so we made the survey anonymous. However, as a by-product of this anonymity, we do not know the location of the specific bases that answered the survey.

Organizational Level

The survey respondents were asked to state the organizational level at which the specific services were acquired—that is, at what level were the procurement process for the services conducted? The results are shown in Table 3 below. The various DoD components acquire services either at the major command (MAJCOM) level, regional level or installation level. Below are the results of the survey. The responses indicate that during all phases of the services acquisition, for a large majority of the services acquired by the Air Force (in about 70% cases), the procurement was conducted at the installation level.



Table 3. Organization Level Used in Acquisition Phases: Air Force

Service/Acquisition Phase	Organization Level		
	Regional	Installation	N/A
Professional, Administrative, and Management Support			
Acquisition Planning	1	27	6
Solicitation	1	27	6
Source Selection	1	26	7
Contract Administration	0	27	7
Maintenance and Repair of Equipment			
Acquisition Planning	1	29	4
Solicitation	1	29	4
Source Selection	1	27	6
Contract Administration	0	29	5
Data Processing and Telecommunication			
Acquisition Planning	4	21	9
Solicitation	4	21	9
Source Selection	4	19	11
Contract Administration	3	22	9
Transportation and Travel			
Acquisition Planning	2	19	13
Solicitation	2	19	13
Source Selection	2	19	13
Contract Administration	1	19	14

Project-team Approach

The survey results about the use of the project-team approach (see Table 4) show that this approach was used in a majority of the acquisitions for all services categories (in about 65% of the cases).

Table 4. Project-team Approach: Air Force

Service Category	Total No. of Organizations	Organizations Using Project Team Approach					Organizations Not Using Project Team Approach				
		SubTotal	Who leads acquisition?		Who owns requirements?		SubTotal	Who leads acquisition?		Who owns requirements?	
			Contracting Officer	Other (PM, QAE)	Contracting Officer	Customer (PM, QAE)		Contracting Officer	Other (PM, QAE)	Contracting Officer	Customer (PM, QAE)
Professional, Administrative, and Management Support	34	25	21	4	5	20	9	8	1	1	8
Maintenance and Repair of Equipment	34	23	17	6	4	19	11	10	1	2	9
Data Processing and Telecommunication	34	21	12	9	3	18	13	7	6	2	11
Transportation and Travel	34	18	16	2	3	15	16	5	11	0	16



Project-team Approach and Service Acquisition Leadership

Regardless of whether the respondents answered yes or no to the utilization of a project-team approach question, the respondents were asked the following two questions:

1. Who leads the acquisition of the service category?
2. Who owns the requirements or approves changes to the requirements?

As shown above in Table 4, the responses to these questions were relatively similar. In a majority of the cases, a contracting officer leads the acquisition process. This clearly indicates that program managers are usually not part of the acquisition process of procuring services at the installation level. Additionally, customers are usually responsible for owning and changing the requirements for services at the installation level.

3.2 Services Acquisition: Navy Survey Results

3.2.1 Contract Characteristics

The data on contract characteristics for various service categories are shown in Table 5 below. Selected observations about FY07 data are also stated below.

Table 5. Contract Characteristics: Navy

	Degree of Competition			Contract Type			Contract Incentive		
	Competitive	Sole Source	N/A	Fixed	Cost	N/A	Award Fee	Award Term	N/A
Professional, Administrative, and Management Support									
FY03	80%	0%	20%	80%	0%	20%	10%	0%	90%
FY04	80%	0%	20%	80%	0%	20%	10%	0%	90%
FY05	80%	0%	20%	80%	0%	20%	0%	10%	90%
FY06	80%	0%	20%	80%	0%	20%	0%	10%	90%
FY07	90%	0%	10%	90%	0%	10%	0%	10%	90%
Maintenance and Repair of Equipment									
FY03	80%	0%	20%	80%	0%	20%	0%	0%	100%
FY04	80%	0%	20%	80%	0%	20%	0%	0%	100%
FY05	80%	0%	20%	80%	0%	20%	0%	0%	100%
FY06	80%	0%	20%	80%	0%	20%	0%	0%	100%
FY07	80%	0%	20%	80%	0%	20%	0%	10%	90%
Data Processing and Telecommunication									
FY03	33%	0%	67%	33%	0%	67%	0%	0%	100%
FY04	33%	0%	67%	33%	0%	67%	0%	0%	100%
FY05	33%	0%	67%	33%	0%	67%	0%	0%	100%
FY06	33%	11%	56%	44%	0%	56%	0%	0%	100%
FY07	33%	11%	56%	44%	0%	56%	0%	0%	100%
Utilities and Housekeeping									
FY03	25%	25%	50%	60%	0%	40%	20%	0%	80%
FY04	25%	25%	50%	60%	0%	40%	20%	0%	80%
FY05	25%	25%	50%	60%	0%	40%	0%	20%	80%
FY06	25%	25%	50%	60%	0%	40%	0%	0%	100%
FY07	20%	40%	40%	60%	0%	40%	0%	0%	100%

- **Professional, administration, and management:** The data showed that in FY07, 90% of contracts were competitively awarded; 80% of contracts were fixed-price contracts, and 90% contracts have no incentives.
- **Maintenance and repair equipment:** In FY07, 80% of contracts were competitively awarded; 80% were fixed-price contracts, and just one contract had an incentive fee attached.



- Data processing and telecommunication: In FY07, 33% of the contracts were from a competitive source; 44% of the contracts were firm-fixed contracts, and no incentives were offered in any contract.
- Utilities and housekeeping: In FY07, 20% of the contracts administered were competitive, and 40% were sole-source; 60% of the contracts cut were firm-fixed-priced.

3.2.2 Acquisition Management Methods

The data was collected from the survey at the installation level. The data inputs were provided by the Navy Regions in charge of the installations in CONUS. We received inputs from 6 Regions—covering 66 Navy installations, plus Naval Supply (NAVSUP) and Naval Medical Logistics Command (NMLC).

Table 6. Organization Level Used in Acquisition Phases: Navy

Service/Acquisition Phase	Organization Level			Total
	Regional	Installation	N/A	
Professional, Administrative, and Management Support				
Acquisition Planning	5	2	3	10
Solicitation	5	2	3	10
Source Selection	5	3	2	10
Contract Administration	3	4	3	10
Maintenance and Repair of Equipment				
Acquisition Planning	4	3	3	10
Solicitation	4	3	3	10
Source Selection	4	3	3	10
Contract Administration	2	6	2	10
Data Processing and Telecommunication				
Acquisition Planning	3	1	5	9
Solicitation	3	1	5	9
Source Selection	3	1	5	9
Contract Administration	2	2	5	9
Utilities and Housekeeping				
Acquisition Planning	2	2	4	8
Solicitation	2	2	4	8
Source Selection	2	2	4	8
Contract Administration	2	2	4	8

Organizational Level

The data regarding the organizational level at which the specific services were acquired is shown in Table 6 below. The majority of the responses indicate that each of the services acquired by the Navy was procured at the regional level—specifically, 62% of the professional, administrative, and management services were acquired at this level. About 68% of the acquisition planning, solicitation and source selection for data processing and



telecommunication services were performed at the regional level. The responses for utilities and housekeeping services showed half of the contracts were planned, solicited, selected, and administered at the regional level, and half at the installation level.

Project-team Approach

The results of our survey (see Table 7) show that a project-team approach was used in approximately 50% of the acquisitions for all services categories.

Table 7. Project-team Approach: Navy

Service Category	Total No. of Organizations	Organizations Using Project Team Approach				Organizations Not Using Project Team Approach			
		SubTotal	Who leads acquisition?	Who owns requirements?	SubTotal	Who leads acquisition?	Who owns requirements?	Contracting Officer	Customer (PM, QAE)
Professional, Administrative, and Management Support	10	6	0	6	2	4	4	3	1
Maintenance and Repair of Equipment	9	5	4	1	1	4	4	0	1
Data Processing and Telecommunication	9	2	2	0	1	1	7	3	4
Utilities and Housekeeping	7	5	4	1	2	3	2	1	1

Project-team Approach and Service Acquisition Leadership

As we examine the results of our survey, we note a 50-50 split in a portion of the data: a program manager leads the acquisition team half the time, and a contracting officer leads the acquisition team half the time. Additionally, we see that approximately 30% of the time, a program manager, contracting officer, or customer owns and manages the requirement in these services contracts.

3.3 Program Management Issues for Both the Air Force and the Navy

In addition to the topics mentioned above, our research objective was also to investigate issues related to the personnel involved in and responsible for various aspects of services acquisition management. The issues include use of lifecycle approach, as well as the length, level, and qualifications of personnel in service acquisition management. We also explored the extent of market research used by decision-makers in awarding services contracts. Table 8 below describes the responses from the survey regarding the scope and ability of personnel responsible for service contracts. Responses for both the Air Force and the Navy (with the corresponding percent of responses) are given in the same table. (Contracting officer is abbreviated to CO, and Quality Assurance Evaluator is abbreviated to QAE.)



Table 8. Scope and Ability of Personnel Responsible for Service Contracts

	Air Force	Navy	
Who writes and awards contracts to provide services?	CO 100%	CO 100%	
Who is responsible for the surveillance of contractor's performance	QAE/COR 91%	QAE/COR 37.5%	CO 37.5%
What type of training do these personnel receive?	DAWIA 41%	Phase I and II 90%	DAWIA 41%
How much time was spent in the QAE position?	12-36 months 79%	Over 36 months 6%	12-36 months 37.5%
			Over 36 Months 50%

The survey asked Likert-scale-based questions related to the use of a lifecycle approach for routine and non-routine services acquisition, the extent of the use of market research, billets for service acquisition management, and responsibilities of the QAE. These are described in Table 9 on the next page. Here, the answers are divided in three categories: percent of respondents that disagreed, were neutral, and agreed. Disagreed and agreed categories include those who disagreed or agreed strongly.

Table 9. Lifecycle Approach, Market Research, Billets and Responsibility

	Air Force			Navy		
	Disagree	Neutral	Agree	Disagree	Neutral	Agree
Lifecycle Approach	%	%	%	%	%	%
For routine services, this was the dominant strategy.	23.5	21	50	50	25	62
For non-routine services, this was the dominant strategy.	41	23.5	29	0	37.5	50
Market Research						
Market Research was conducted for the acquisition of services.	0	3	97	0	0	100
Services Acquisition Billets						
There is an adequate number of staff positions.	59	6	35	37.5	25	25
These positions are adequately filled.	65	9	18	50	12.5	25
These staff members are adequately trained.	9	21	53	12.5	25	50
These staff members are adequately qualified.	9	26.5	65	12.5	12.5	62.5
Responsibility of Staff Members						
Persons identifying requirement also write the SOW/SOO document.	6	3	91	62.5	12.5	2.5
QAE receive prior formal/document training.	0	0	100	12.5	12.5	75
QAE submit written requests of performance and quality of work to CO.	9	6	85	12.5	25	62.5
<i>Proper level of oversight is afforded to monitor contractor performance.</i>	15	6	79	37.5	37.5	25



4.0 Research Findings and Recommendations

This research provided a first look at empirical data related to the acquisition of services within the Department of Defense. The application of the survey to Air Force and Navy acquisition offices provided some real-world data on the characteristics of services contracts (degree of competition, contract/incentive type), various management approaches used (organizational level and project-team approach), and other program management issues (use of project lifecycle, length of acquisition personnel service, extent of market research, level of staffing, and training of staffing). Below is a summary of our research findings. This is followed by our recommendations.

4.1 Research Findings

Contract Characteristics

The common contract characteristics reflect the use of competitively awarded, fixed-priced contracts. Additionally, contract incentives, or award fees, were typically not used in these services contracts.

Acquisition Management Methods

The Air Force and the Navy differed in terms of the organizational levels at which the acquisition contracts are managed. For the Air Force, the majority of the procurements conducted and contracts managed are done so at the installation level. On the other hand, the services contracts for the Navy are managed at the regional level. This difference in organizational levels may provide additional insight into the effectiveness of the Air Force's and Navy's services contract management. The relation of where the contracts are managed to where the services are actually performed may have an impact on the effectiveness of the contract management process.

In terms of the use of a project-team approach, another distinction can be made between the Air Force and the Navy. The Air Force used a project-team approach in managing its services contracts (64%) more than did the Navy (51%). Best practices in contract management reflect the use of project teams—specifically cross-functional teams—in the management of service procurement projects. Further analysis of the implications of not using a project-team approach in Navy contracts should be conducted.

Related to the use of project teams is the issue of who is to lead the acquisition effort at the installation. For Air Force services contracts in which a project team was used, 80% of the respondents stated that the contracting officer led the acquisition team, while only 20% stated that program personnel led the teams. For Navy services contracts in which a project team was used, 65% of the respondents stated that program personnel led the acquisition team, while 35% stated that contracting officers led the teams.

These results reflect the precarious situations in which contracting officers find themselves as they manage the services procurement process. Not only are they responsible for managing the contractual aspects of the project, they are also responsible for leading the acquisition team. Most of the acquisition team members are not even part of the contracting organization, nor do they work for the contracting officer. This may be problematic for the success of the contract management effort.



It is also interesting to note that at Air Force installations where a project team is not employed in the acquisition of services, the contracting officer is still responsible for leading the acquisition effort in 73% of the cases. At Navy installations where a project team is not employed in the acquisition of services, the contracting officer is still responsible for leading the acquisition effort in approximately 100% of the cases. This situation, in which the contracting officer must lead a coordinated effort (involving technical, financial, and customer personnel) in procuring critical services without the use of a project team, may catalyze some of the problems in managing services contracts that were identified by the GAO.

Also related to services acquisition leadership is the issue of who should own and manage the requirement. In this research, the requirement is the specific service that is being procured—for example, operations research services (a specific professional, administrative, or management service) for a DoD agency. It is important to note that the contract management process and, more specifically, the authorities and responsibilities of the contracting officer, do not include requirements-management activities (such as determining the requirement, modifying the requirement, assessing the effectiveness of the requirement). These activities belong to the requirements owner—usually the organization responsible for the function or service being procured. For example, an Air Force civil engineering organization would own and manage the grounds maintenance and custodial services being acquired by the contracting organization for that specific installation.

This research indicated that for Air Force services acquisitions in which project teams were employed, approximately 82% of the respondents stated that program management personnel owned the requirement (as opposed to contracting officers). For Navy services acquisitions in which project teams were employed, approximately 41% of the respondents stated that program management personnel owned the requirement, while approximately 30% of the respondents stated that either the contracting officer or customer owned the requirement. In Air Force services acquisition in which a project team was not used, approximately 85% of the respondents stated that program management personnel owned the requirement. In Navy services acquisition in which a project team was not used, approximately 67% of the respondents stated that customer personnel owned the requirement; approximately 33% of the respondents stated that contracting officers owned the requirement.

It is interesting to note that although program management personnel owned and managed the requirement in these services contracts, we still see contracting officers leading the acquisition effort (80% with project teams and 73% without). These situations—in which contracting officers are leading the acquisition teams although the requirements are owned and managed by program personnel—may prove problematic to the effectiveness of the services acquisition. This could result in the blurring of (or at least a conflict in) the roles and responsibilities of authorities in the acquisition of services and the management of service requirements.

Program Management Issues

The survey responses to the program management questions provide some additional and interesting insight into the acquisition of services by the Air Force and the Navy. These areas include responsibility for surveillance of contractor's performance and time spent performing QAE duties.

It is interesting to note that approximately 38% of the Navy respondents stated that the Contracting officer is responsible for providing surveillance of the contractor's performance. This



differs from the Air Force respondents (91%), who stated that the QAE is responsible for contractor surveillance. Surveillance of contractor performance, especially for performed services, requires technical expertise in the service provided. For example, government information technology (IT) specialists should typically monitor the IT contractor performing IT support services. The level of technical expertise in the surveillance of contractor performance should be a concern for ensuring effective contract administration of services contracts. Contracting officers typically do not have the technical expertise needed to effectively perform contractor surveillance. Nor does the CO usually have the requisite expertise to develop the requirements documents (SOO or SOW) or the quality assurance surveillance plan. Thus, the question of “can the CO provide proper surveillance of the contractor” comes into discussion. We will further address this issue in the program management section below.

In the program-management-related questions, for routine services, over 50% of both Air Force and Navy respondents stated that a lifecycle approach was used. Of note is that only 29% of Air Force (compared to 50% of Navy) respondents stated that the use of a lifecycle approach was used in non-routine services. The use of a lifecycle approach should be a concern for ensuring proper project management of non-routine services contract acquisition. Since the services being acquired are of a non-routine nature, one would expect higher levels of uncertainty—and, thus, higher levels of project risk—in the acquisition process for these services. One method for reducing risk is through the use of a project lifecycle—with project phases, gates, and decision-points for monitoring and controlling the progression of the services acquisition process. Without the use of a project lifecycle, the services acquisition project may be vulnerable to excessive risk in terms of meeting cost, schedule, and performance objectives. This would especially be true in the acquisition of non-routine services.

The majority of both the Air Force and Navy respondents answered the question on the use of market research in the acquisition of services affirmatively. The data—97% (Air Force) and 100% (Navy)—suggest compliance with the requirement in the *Federal Acquisition Regulation (FAR)* to conduct market research as the first step in any acquisition. It would be interesting to conduct follow-on research to analyze the extent of documentation supporting the market research activities of these agencies. Recent GAO and Inspector General reports have suggested the lack and sufficiency of market research documentation in the DoD.

The survey results also provide some interesting insight into the staffing of services acquisition management billets. These questions focused on the number of billets, staffing of these billets, training of personnel in these billets, and the qualifications of the personnel in these billets. Of special note is that neither the Air Force nor Navy respondents felt there were an adequate number of services acquisition billets; indeed, only 35% and 25% (respectively) responded to the question in the affirmative. Additionally, neither the Air Force nor Navy respondents felt the services acquisition billets were adequately filled; only 18% and 25% (respectively) responded that they were. However, both the Air Force and Navy stated that the services acquisition management personnel were adequately trained (53% and 50%, respectively) and adequately qualified (65% and 62%, respectively).

In terms of the responsibility of the services acquisition personnel, we see some differences between the Air Force and the Navy. In particular, we see strong differences between the Air Force and Navy in who writes the requirement document, such as the SOO or the SOW. For the Air Force, 91% of respondents agreed that the person identifying the services acquisition requirement also writes the requirement document. On the other hand, only 2.5% of the Navy respondents agreed to this statement. There are also differences of opinion (79%, Air Force, and 25%, Navy) as to whether a proper level of oversight is afforded to monitor



the contractor's performance. These results are somewhat related to the question discussed above: "Can the CO provide proper surveillance of the contractor?"

The first area of difference between the two services' respondents (the issues of identifying the requirement versus developing the requirements documents) may indicate a mixing of services acquisition roles and responsibilities. The significance of these activities reflects the distinction between the services acquisition requirements process and contracting process. The purpose of the requirements process is to determine, define, and develop the service requirement that will be acquired—for example, IT support services. Once the requirements agency identifies, develops, and defines the requirement, the contracting office performs the contracting activities to acquire the needed services. The contracting office does not identify or determine the service requirement. Contracting officers, however, may support the development of the requirements documents by providing business and procurement expertise in this area. When these two distinct processes are mixed, blurred, or performed by the same organization or individual, there is a potential for unsuccessful acquisition results, a higher risk of not meeting project objectives, and even the potential for procurement fraud.

The Air Force responses show a strong connection between the two activities of identifying the requirement and developing the requirements documents. Thus, within the Air Force, the requirements organization—where the technical expertise is located—manages these activities. The Navy, on the other hand, apparently separates the process of identifying the requirement from the process of developing the requirements documents. Although the survey does not ask who develops the requirement documents (if different than the requirements identification organization), one may assume that it may be the contracting officer, based on the previous survey question of who writes and awards the services contracts. In this situation, the Navy seems to have the organization with the technical expertise and responsibility for managing the requirement identifying the services acquisition requirement, and the contracting officer (who is not a technical expert) developing the requirements documents. Thus, within the Navy, the contracting officer not only conducts the contracting activities for the procured services, but also writes the requirements documents that communicate these services to potential offerors. This mixing of roles and responsibilities between requirements and contracting organizations may lead to ineffectiveness in the services acquisition process as well as vulnerabilities for procurement fraud. The question of whether the contracting officer has the requisite technical expertise to develop the SOW for the service requirement—IT support services, for example—raises a critical issue.

This issue of technical expertise is also raised in the survey. One question asks whether a proper level of oversight is afforded to monitor the contractor's performance. In response to this question, the Air Force (79%) differed significantly from the Navy (25%). The strong Air Force response may be linked to the previous statement that the QAE, a technical expert, is responsible for contractor surveillance (91%), while the Navy response indicates that the contracting officer (37.5%) or the QAE (37.5%) is responsible for surveillance of the contractor's performance. Regardless of inference, the fact that only 25% of the Navy respondents consider contractor oversight to be properly monitored is a strong message regarding the effective management of services acquisition.



4.2 Recommendations

The majority of the contracts administered conformed to the expectation of the researchers. The surveys indicate that most service contracts are competitively bid, fixed-priced awards without any incentive. The researchers discovered that the Navy had regionalized most contracting; in such cases, the contracting officer representative (COR) at the installation submits requirement requests to the regional offices. Table 8 indicates that the CO typically writes and awards the contracts, and the COR (or customer's organization) is responsible for surveillance of those contracts. The majority of the service acquisition personnel have a variety of training, from project management to *DAWIA*.

This empirical study on DoD services acquisition reflects that the Air Force and Navy use different contracting approaches in the following areas: organizational level of acquisition offices (regional versus installation), the use of project teams, leaders of the acquisition effort (program personnel versus contracting officers), and managers of the services requirement (program personnel, contracting officers, and customer organizations). Our research has identified some of the impacts and implications of the different approaches on the effectiveness of the contract management process. Further research should investigate the reasons why the Air Force and Navy use these different approaches and could identify any best practices and lessons learned resulting from the use of these approaches.

5.0 Current Research

The objective of the ongoing fourth research project is to collect empirical data on the current management practices of services acquisition within the US Army. To collect this data, an anonymous, web-based survey was employed using the survey software "Survey Monkey." The survey included a total of 81 questions; however, utilizing embedded logic functionality within the survey, participants only provided responses to approximately 60 questions.

The participants for this survey were selected based on the organization they worked for and their position within the organization. The goal was to gather data from every organization within the Army Contracting Command that directly manages or oversees the contracting of services. Once all of the organizations were identified, the individual personnel were selected based on their position within the organization. The researchers sought to have senior contracting officers within the selected organizations complete the survey. The purpose here was to ensure that the person completing the survey had a comprehensive view and understanding of how his/her organization managed services contracts.

The only exception to the criteria above was the exclusion of the Expeditionary Contracting Command from taking the survey. The researchers intentionally omitted the organization within this command for two primary reasons. First, because of the uniqueness of contracting that takes place during contingency operations, the researchers felt the data provided by the Expeditionary Contracting Command would not accurately reflect or correlate well with contracting practices during peacetime operations. Secondly, the researchers did not want to add additional work to these personnel because of the environment and existing workload that Expeditionary Contracting Command is already experiencing.

The survey link was sent to 81 organizations in February 2009. The survey remained available through mid-March, giving the participants sufficient time to respond. At the end of this period, a total of 61 surveys were fully completed, which represents a 75% response rate.



The survey responses are presently being compiled and analyzed. A report based on the survey results will be prepared in summer 2009.

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6TH ANNUAL ACQUISITION RESEARCH SYMPOSIUM

Managing the Services Supply Chain in the Department of Defense: An Empirical Study of Current Management Practices

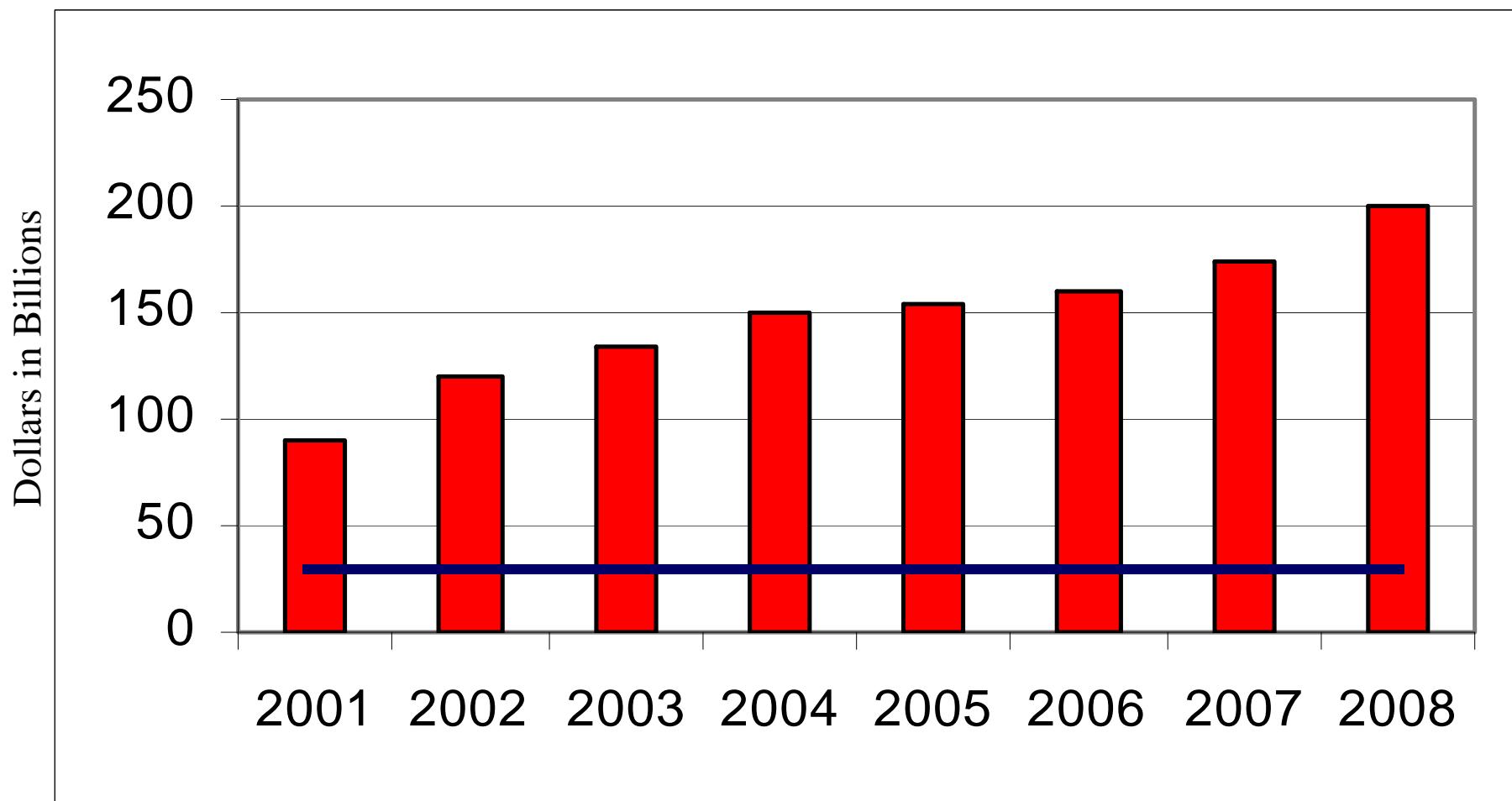
Aruna Apte, Uday Apte, Rene Rendon

Naval Postgraduate School

Overview

- Previous Research Findings
- Current Research Focus
- Research Survey Results
- Conclusion

DoD Services Acquisition Environment



DoD Spending on Services
(Adapted from GAO data)

Managing the Service Supply Chain in the Department of Defense: Ongoing Research

FY 2006: Opportunities and Challenges

FY 2007: Implications for a Program Management Approach

FY 2008: An Empirical Study of Current Management Practices (Navy and Air Force)

FY 2009: An Empirical Study of Current Management Practices (Army)

Previous Research Findings

- Continued growth in the volume of services acquisition in DoD
- It is difficult to establish service specifications and measure and monitor service output and quality. Hence, having on board the right number of skilled acquisition personnel is highly critical. The observed downsizing of contracting workforce does not appear to be in line with this need.

Previous Research Findings

- The management infrastructure for the acquisition of services is less developed than that for acquisition of products and systems.
- Less formal approach to the acquisition and management of services
- Lack of standardization of business practices in services acquisition

Previous Research Findings

- Traditional approach to managing services acquisition does not incorporate a project/program management approach
 - Well-defined, disciplined methodology and infrastructure
 - Centralized, coordinated management
 - Designated manager with project authority
 - Integrated cross-functional teams
 - Enabling organizational structure
 - Project lifecycle
 - Integrated processes

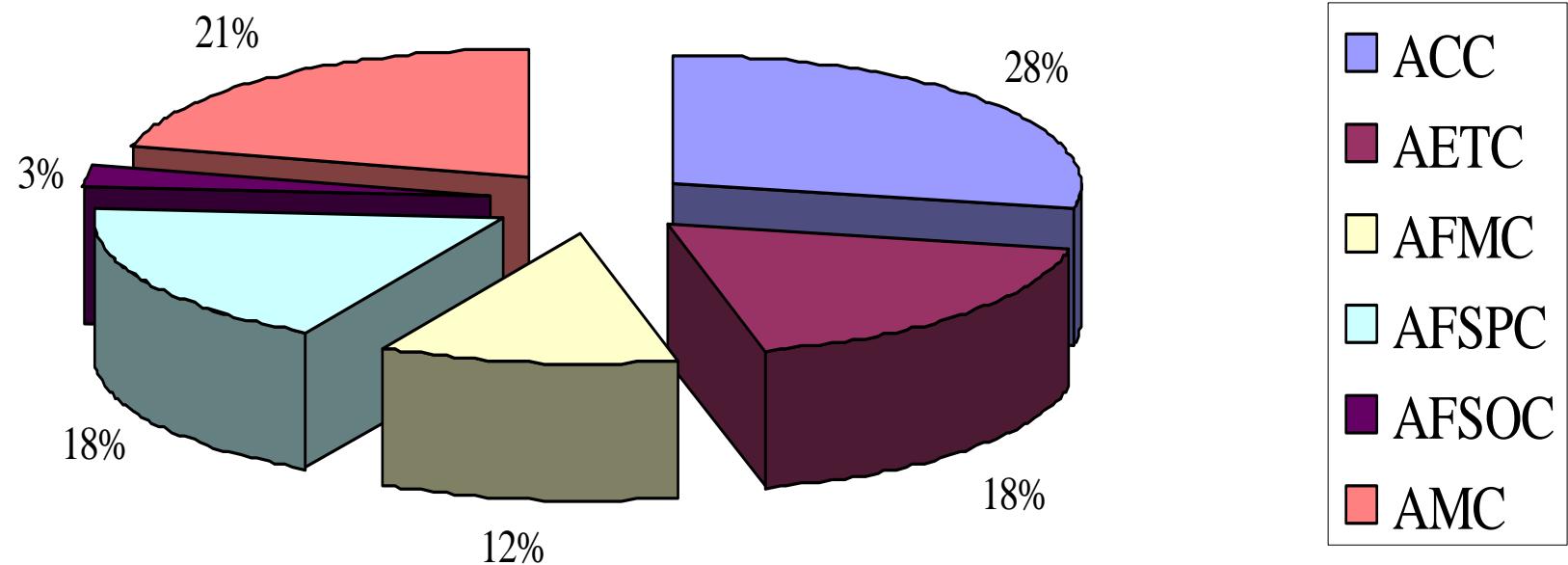
Services Life Cycle (Conceptual)



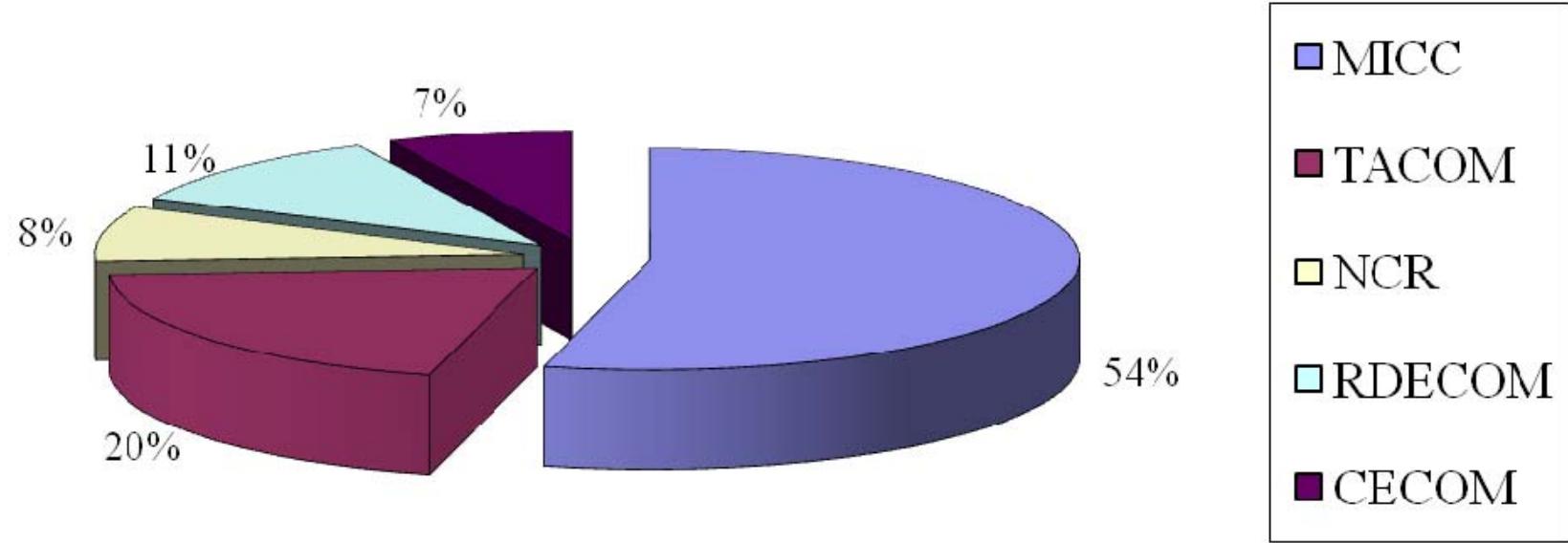
Current Research: An Empirical Study of Current Management Practices

- On-line anonymous survey deployed to Navy, Air Force and Army contracting organizations
- Survey questions focused on:
 - Contract characteristics
 - Program management methods
- Air Force $n = 34$ responses (68% response)
- Army $n = 61$ responses (75% response)
- Navy $n = 66$ responses (87% response)

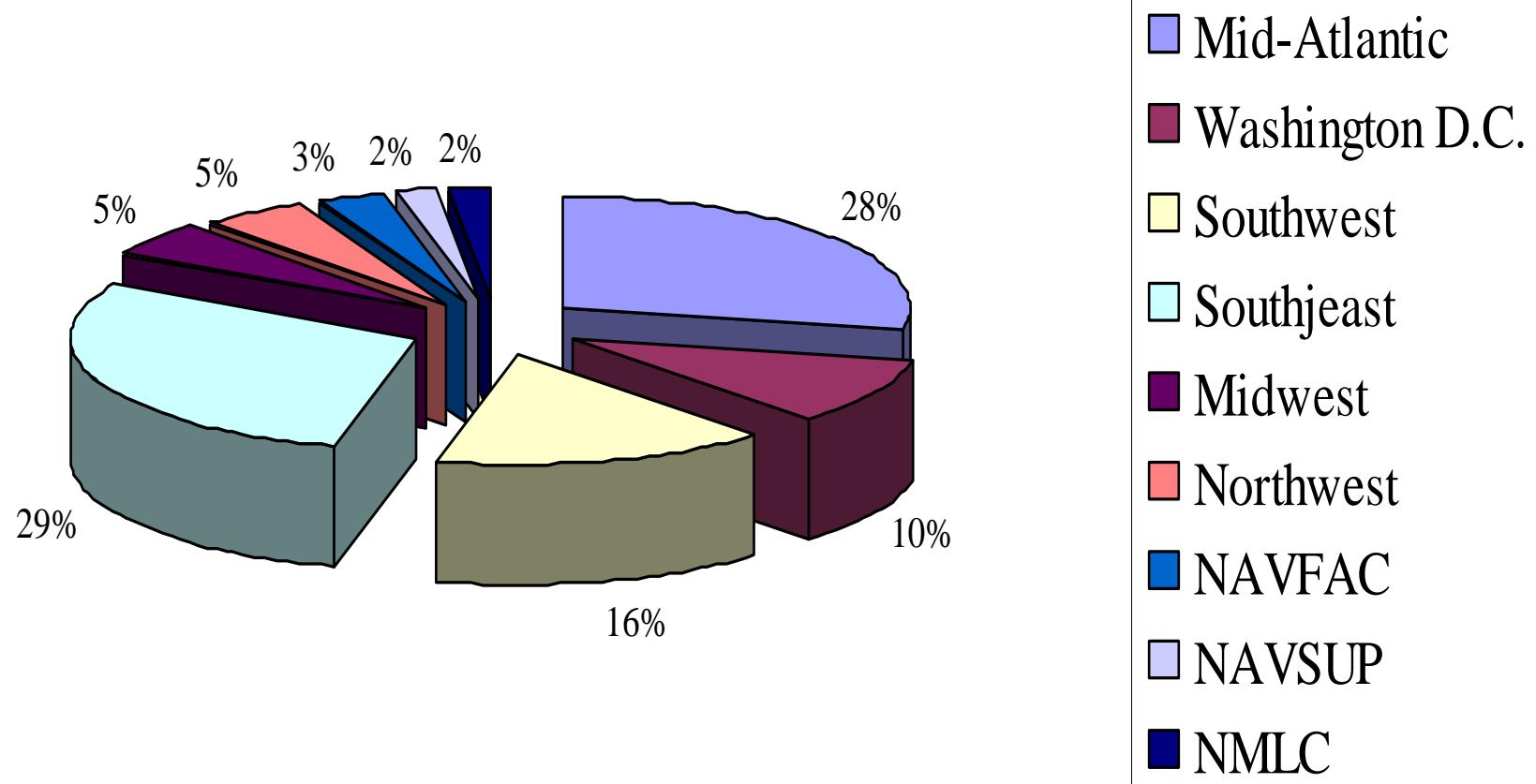
Air Force Major Commands



Army Major Commands



Navy Major Commands



Current Research: An Empirical Study of Current Mgmt Practices

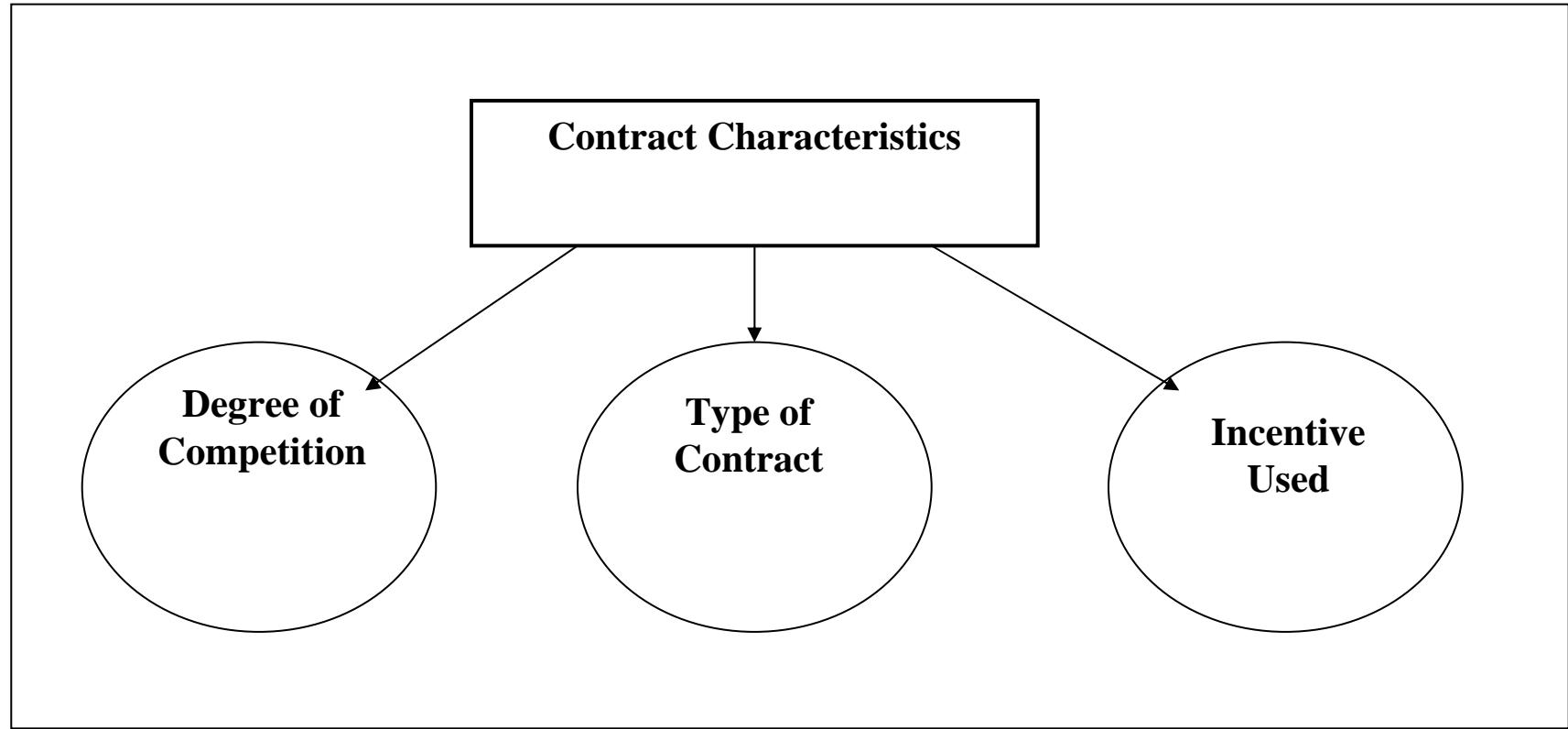
- What types of services are typically procured at military installations?
- What type of acquisition strategy, procurement method, and contracts are used in these services acquisition?
- How is the service acquisition process managed? What program management concepts—such as project managers, project teams, lifecycle, are used?

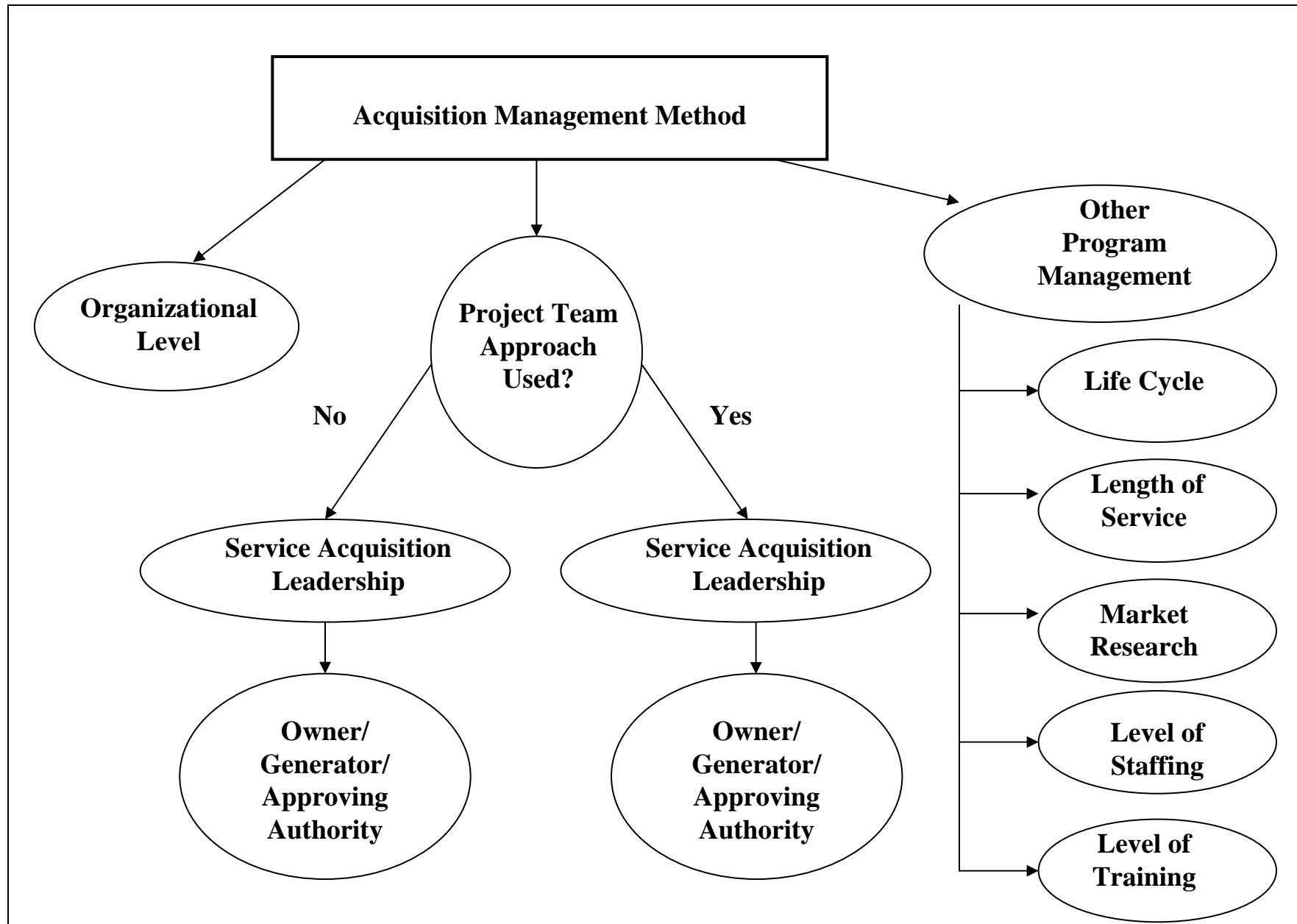
Current Research: An Empirical Study of Current Mgmt Practices

- What type of organization/management structure is used to manage the services acquisition?
- What training is given to contract and project/program management staff?
- Are there any significant differences between the way services are acquired and managed in different DoD departments?

Service Categories

Service Category	Classification Code	Air Force	Army	Navy
Professional, administrative, and mgmt. support	R	X	X	X
Maintenance and repair of equipment	J	X	X	X
Data processing and telecommunications	D	X	X	X
Medical	Q		X	
Maintenance and repair of real property	Z		X	
Utilities and housekeeping	S		X	X
Transportation and travel	V	X	X	





Analysis of Survey Results

- A clear distinction can be made concerning the **organizational levels** in which services contracts are managed.
 - Air Force and Army: Majority of services contracts are managed at the installation level.
 - Navy: Majority of services contracts are managed at the regional level.

Analysis of Survey Results

- The proximity of where the contracts are managed to where the services are actually performed may have an impact on the effectiveness of the contract management process.

Analysis of Survey Results (continued)

- A slight distinction can be seen in the use of a **project team approach** in managing services acquisitions.
 - The Air Force and Army used a project team approach approximately the same amount.
 - The Navy used a project team approach slightly less than Air Force and Army.
- Best practices in contract management reflect the use of project teams, specifically integrated teams, in the management of service acquisition projects.

Analysis of Survey Results (continued)

- A distinction can be made in **who leads** the services acquisition effort.
 - Air Force: the contracting officer leads the acquisition effort, regardless of the use of project teams.
 - Army: the contracting officer leads the effort when project teams are used. However, when project teams are not used there is no clear distinction of who leads the effort.
 - Navy: program management personnel lead the effort when project teams are used. However, contracting officers lead the effort when project teams are not used.

Analysis of Survey Results (continued)

- The contracting officer may be in a precarious situation in leading the acquisition effort and taking on project manager responsibilities.
- Services acquisition personnel are typically not part of an acquisition organization, nor are they members of the acquisition workforce . This may be problematic for the success of the contract management effort.

Analysis of Survey Results (continued)

- Requirements management is typically performed by the project manager in Air Force and Army contracts. However, in Navy contracts, the contracting officer managed the requirement in approximately 33% of the time.
- When contracting officers lead the acquisition effort as well as manage the requirements it may result in the appearance of a conflict of interest in the roles and responsibilities of PM and CO authorities.

Analysis of Survey Results (continued)

- QAEs provide **contractor surveillance** in most (91%) Air Force contracts. However, in the Navy, QAEs perform surveillance 60% of the time while in the Army it was only about 30%.
- “Do COs have the requisite technical knowledge to conduct proper surveillance”?
- “Should COs perform contractor surveillance functions”?

Analysis of Survey Results (continued)

- Project lifecycle approach was used in approx half of routine services contracts for Air Force, Army and Navy. However, only approx 30% of Air Force contracts and 20% of Army contracts used lifecycle approach for non-routine services. In the Navy, the life cycle approach was not used at all for non-routine services.
- Non-routine services may involve higher-levels of uncertainty and risk. Thus, these services can benefit from the use of a lifecycle approach in managing the services acquisition project.

Analysis of Survey Results (continued)

- The Air Force, Army and Navy generally agreed that
 - There was an inadequate number of **services acquisition billets**
 - Services acquisition billets were inadequately filled
- Both Air Force and Navy generally agreed that services acquisition personnel were adequately **qualified**, the Army was divided evenly
- Air Force agreed that a proper level of **contractor oversight** was provided while the Army and Navy disagreed

Analysis of Survey Results (continued)

- Air Force and Army differed significantly from the Navy on the requirements management process
 - Air Force and Army - requirements identification and **SOO/SOW development** performed by the requirements organization
 - Navy - requirements identification and SOO/SOW development are performed by different organizations and may be performed by the CO
- Mixing of requirements management roles and responsibilities may lead to ineffectiveness as well as vulnerabilities for procurement fraud

Conclusions

- Air Force, Army and Navy all have different approaches to managing services acquisition projects
- The approach used for managing services acquisition projects may have implications on the effectiveness of the contract management process and the success of the acquisition project

Back up Slides

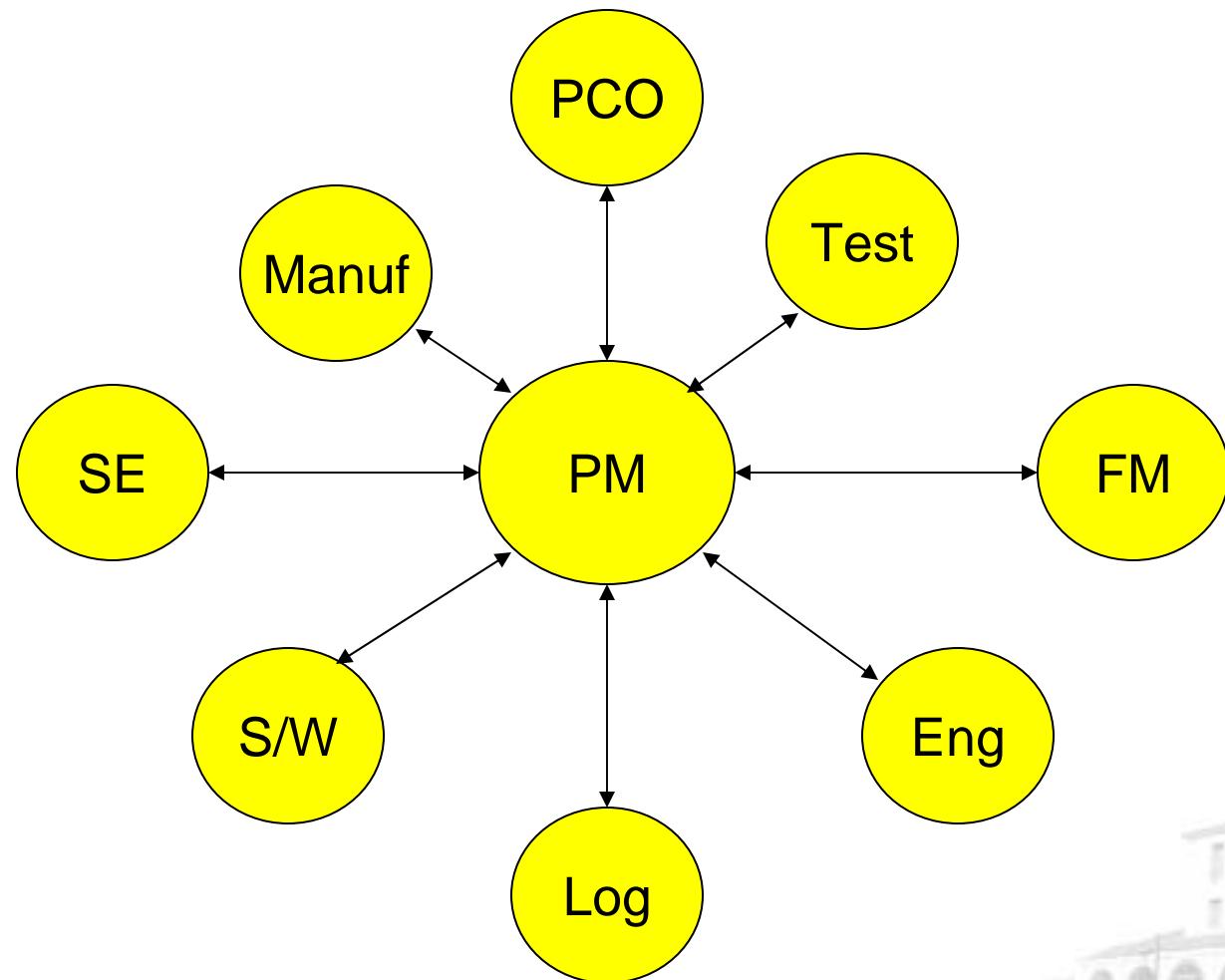


Acquisition Research: Creating Synergy for Informed Change
3rd ANNUAL ACQUISITION RESEARCH SYMPOSIUM

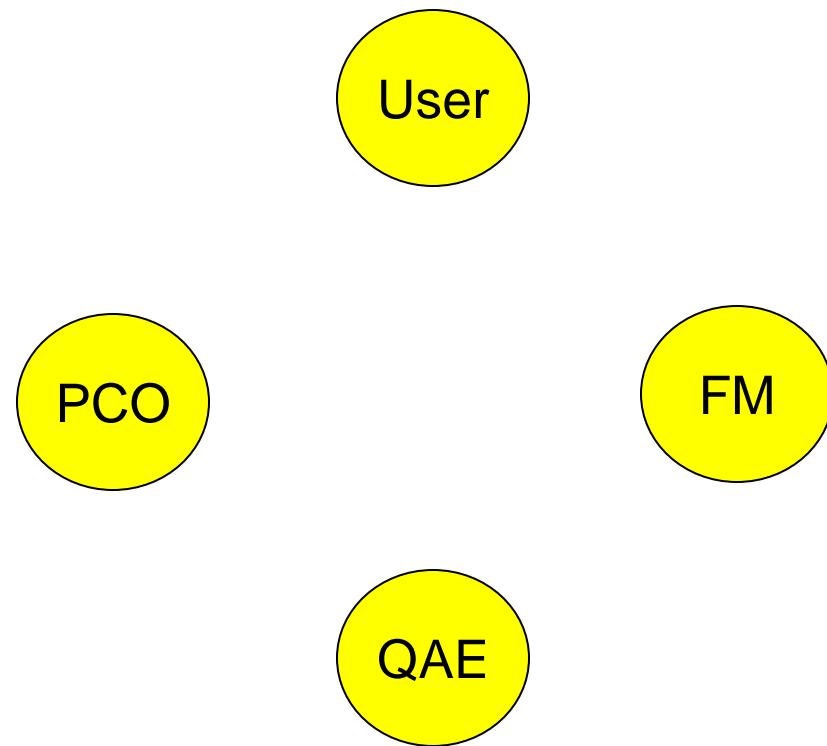
May 17-18, 2006
Monterey, CA



Major Systems Acquisition



Services Acquisition



Previous Research Findings

- Innovative approaches to management of services acquisition programs
 - Air Education and Training Command (AETC)
 - AETC Program Management Flight
 - AETC Contracting Squadron
 - Air Combat Command (ACC)
 - Acquisition Management and Integration Center
 - Centralized Planning, Control, and Execution
 - Combined program management and contracting organization



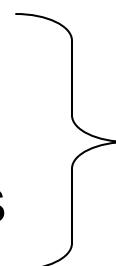
Contract Characteristics

- Air Force, Army and Navy
 - Competitively awarded
 - Fixed-price contracts
 - Typically not using contract incentives, award fees or award terms



Organizational Levels

- Air Force & Army
 - Pre-award activities
 - Post award activities
- Navy
 - Pre-award activities
 - Post award activities



Installation level
Approx 70%



Regional level
Approx 60%



Project Team & Project Managers

- Air Force:
 - Approx 64% use project team approach
 - When a project team is used
 - PCO is the project manager (80%)
 - Other than PCO is project manager (20%)
 - When a project team is not used
 - PCO leads and manages the project effort (73%)



Project Team & Project Managers

- Army:
 - Approx 62% use project team approach
 - When a project team is used
 - PCO is the project manager (68%)
 - Other than PCO is project manager (32%)
 - When a project team is not used
 - PCO leads and manages the project effort (48%)



Project Team & Project Manager

- Navy:
 - Approx 51% use a project team approach
 - When a project team is used
 - PCO is the project manager (35%)
 - Other than PCO is project manager (65%)
 - When a project team is not used
 - PCO leads and manages the project effort (100%)



Requirements Management

- Air Force:
 - When a project team is used
 - The requirement is managed by other than PCO (82%)
 - When a project team is not used
 - The requirement is managed by other than PCO (85%)



Requirements Management

- Army:
 - When a project team is used
 - The requirement is managed by other than PCO (74%)
 - When a project team is not used
 - The requirement is managed by other than PCO (78%)



Requirements Management

- Navy:
 - When a project team is used
 - The requirement is managed by other than PCO (41%)
 - When a project team is not used
 - The requirement is managed by other than PCO (67%)



Contractor Surveillance

- Air Force:
 - Contractor surveillance is performed by a QAE (91%)
- Army:
 - Contractor surveillance is performed by other than PCO (87%)
- Navy:
 - Contractor surveillance is performed by other than PCO (62%)



Lifecycle Approach

- Air Force:
 - A lifecycle approach is used in managing routine services projects (50%)
 - A lifecycle approach is used in managing non-routine services projects (29%)



Lifecycle Approach

- Army:
 - A lifecycle approach is used in managing routine services projects (41%)
 - A lifecycle approach is used in managing non-routine services projects (21%)



Lifecycle Approach

- Navy:
 - A lifecycle approach is used in managing routine services project 50%
 - A lifecycle approach is used in managing non-routine services project 50%



Acquisition Billets/Contractor Surveillance

- Air Force:
 - Adequate Number of Billets: 35%
 - Billets Adequately Filled: 18%
 - Personnel Adequately Trained: 53%
 - Personnel Adequately Qualified: 65%
 - Proper level of contractor surveillance: 79%



Acquisition Billets/Contractor Surveillance

- Army:
 - Adequate Number of Billets: 13%
 - Billets Adequately Filled: 16%
 - Personnel Adequately Trained: 39%
 - Personnel Adequately Qualified: 46%
 - Proper level of contractor surveillance: 23%



Acquisition Billets/Contractor Surveillance

- Navy:
 - Adequate Number of Billets: 25%
 - Billets Adequately Filled: 25%
 - Personnel Adequately Trained: 50%
 - Personnel Adequately Qualified: 62%
 - Proper level of contractor surveillance: 25%



Development of SOO/SOW

- The SOO/SOW is developed by the requirements owner:
 - Air Force (91%)
 - Army (84%)
 - Navy (2.5%)

